- Improve the capability to design, develop, certify, and complete production of new or adapted warheads in the event of new military requirements;
- Produce required quantities of warheads in time to meet military requirements;
- Demonstrate nuclear competencies that assure allies, dissuade adversaries, and ensure against technological surprise;
- Sustain readiness to conduct underground nuclear tests; and,
- Ensure an economically sustainable nuclear weapons enterprise.

From its origins in the Manhattan project, the nuclear weapons complex and the stockpile it supports have experienced major changes. Major reductions in the numbers and types of weapons, establishment of Stockpile Stewardship Program, closure of material and manufacturing production sites, and re-configuration of non-nuclear production are examples of notable changes to the Complex over the past 20 years alone. Now we must identify what will best serve the needs of the future.

NNSA has developed a planning scenario for the nuclear weapons complex of 2030. We have also defined a number of first steps on the path forward. These first steps will continue ongoing transformation efforts and allow for further consideration of alternatives to achieve a responsive, dynamic enterprise for the long-term. It offers a path toward achieving the President's vision of the smallest stockpile consistent with our Nation's security.

This scenario is not the only plausible future, and we do not underestimate the challenge of transforming the enterprise, but this is the future we will strive for. Our scenario would place the nuclear weapons complex on a robust path forward that meets both near-term requirements of the stockpile and long-term nuclear capabilities essential to national security.

STRATEGIES

STRATEGY 1: In partnership with the DoD, transform the nuclear stockpile through development of RRWs, refurbishment of limited numbers of legacy designs, and accelerated dismantlement of the Cold War stockpile:

The first strategy comprises the following elements:

- Ensure the viability of legacy weapons deployed to the stockpile until replaced through a comprehensive strategy of maintenance, surveillance, and refurbishment;
- Accelerate dismantlement completion from calendar years 2034 to 2023 of legacy weapons currently planned for retirement;
- Engage in partnership with DoD to transform the nuclear stockpile. Upon favorable completion of the current study, implement an RRW strategy as an enabler of transformation. Establish an RRW-based stockpile plan by the end of 2007 with a majority of intercontinental ballistic missile, submarine-launched ballistic missiles, bombs, and cruise missiles transitioned to RRW-types by 2030. Ensure the stockpile has a heterogeneous mix of warheads for diversity. Use the science-based stockpile stewardship tools established over the past decade to enable RRW design and certification without resumption of underground nuclear testing. Reduce the number of legacy

warheads of specific types that are processed through current life-extension programs and consider canceling some life-extensions to enable a more rapid transformation of the total stockpile;

- Implement a continuous design/deployment cycle that exercises design and production capabilities and enables responsiveness of the nuclear weapons complex. Develop a business case for an optimal future design/deployment cycle that balances responsiveness objectives, weapon life-cycle costs, and training of new personnel;

- Transform the stockpile without resumption of underground nuclear testing however, sustain the capability to conduct underground tests at NTS; and,

- Implement changes in surveillance evaluation methods that reduce the cost of surveillance. Minimize destructive evaluation of warhead components through alternate methods of assessment. Investigate commonality in instrumentation packages and architectures, and other initiatives to reduce costs. Expand the number of modern test ranges available for testing by eliminating SNM from future flight-test units, and determine evaluation techniques that will reduce future flight-test requirements.

The stockpile will be smaller, with fewer warhead types, and will contain warheads with enhanced safety, security, and use-control features. Warheads will also be easier to manufacture with large performance margins reducing the likelihood that the United States will ever need to perform an underground nuclear test. A capability to rapidly augment the stockpile, if needed, through infrastructure responsiveness will replace a requirement to maintain warheads in reserve.

Responsiveness means understanding needs and having the capability to meet those needs with a defined set of capabilities and capacities. The Complex will demonstrate responsiveness through continuous, effective operations. Planned, periodic cycles for design, engineering development, certification, production, and dismantlement will maintain critical skills, promote workforce excellence, and provide for cross-generational training throughout the Complex. During transformation, the NNSA will continue to meet its current national security responsibilities without interruption.

STRATEGY 2: Transform to a modernized, cost-effective nuclear weapons complex:

The following are proposed for this strategy:

- Reduce the number of sites with Category I/II SNM and consolidate SNM to as few locations within a given site as soon as practical.

  - Phase out operations involving Category I/II SNM at all national laboratories.

  - Eliminate need for Category I/II SNM security at Sandia National Laboratories (SNL) by the end of 2008.

  - Remove Category I/II SNM from Lawrence Livermore National Laboratory (LLNL) by the end of 2014 assuming necessary capability and capacity for pit surveillance, plutonium experiments, and surety experiments will be available at LANL. Develop a plan in 2007 for removal of Category I/II SNM and transition of LLNL programmatic work involving Category I/II SNM to LANL and NTS. Start moving material from LLNL in 2008 or earlier.

- By 2022, LANL will not operate facilities containing Category I/II quantities of SNM. The location and operator of the consolidated plutonium center will be determined following completion of appropriate National Environmental Policy Act reviews.

- Upgrade Y-12 facilities to serve as the Category I/II uranium center of excellence.
  - Complete a Highly Enriched Uranium Materials Facility (HEUMF). Store consolidated Category I/II uranium materials in the HEUMF.
  - Plan, construct, and operate a Uranium Processing Facility (UPF) at Y-12 to reduce security costs, provide an efficient means to consolidate existing uranium materials contained in legacy weapons, dismantle legacy canned subassemblies (CSAs), support highly-enriched uranium research, and provide a long term capacity for new CSA production. The UPF would have a baseline capacity of 125 units per year net to the stockpile.
  - Reduce by 90% the Y-12 security footprint for Category I/II uranium operations and reduce square footage for all Y-12 facilities by nearly 50%.

- Plan, construct, and startup a consolidated plutonium center for long-term R&D, surveillance, and manufacturing operations. Plan the consolidated plutonium center for a baseline capacity of 125 units per year net to the stockpile by 2022.
  - Upgrade LANL plutonium facilities at Technical Area 55 to support an interim production rate of 30 to 50 RRW war reserve pits per year net to the stockpile by 2012.
  - Complete and operate the Chemistry and Metallurgy Research – Replacement as a Category I/II facility up to 2022 (use as a Category III/IV facility and focal point and for material science thereafter) to support plutonium operations at LANL, closure of existing LANL Chemistry and Metallurgy Research facility, and the removal of Category I/II quantities of plutonium from LLNL.

- Improve assembly/disassembly throughput at Pantex. Upgrade and modernize Pantex for the long-term as necessary. Consider the NTS Device Assembly Facility as backup for weapon assembly and disassembly operations.

- Transition large-scale hydrodynamic testing to NTS as the Dual-Axis Radiographic Hydrodynamic Testing (DARHT) facility reaches end of life in the 2020s. In the interim, consolidate facility capacity and experimental capabilities needed to meet national hydrodynamic experiment workload. Prepare a disposition plan in 2007 for Site 300 that includes potential environmental cleanup requirements.

- Retain tritium production and stockpile support services at Savannah River Site. Continue to use commercial light-water-reactors as the source of new tritium.

- Outsource non-nuclear component production to commercial suppliers and utilize commercial off-the-shelf components in designs consistent with best security practices and cost-effectiveness. For non-nuclear components currently produced at the Kansas City Plant, occupy a new, smaller, non-nuclear production facility by 2012 producing components that cannot be out-sourced, e.g., component final assembly and use-control components.

- Consolidate large-scale, HE production pressing and machining at Pantex.

- Consolidate HE R&D and laboratory-scale HE testing without the presence of Category I/II quantities of SNM.
- Maintain a secure transportation asset to support DOE requirements.
- Operate the highest-speed computing capability in the complex as a national user facility, accessible complex wide, to address the most challenging and pertinent stockpile stewardship issues. Reduce the number of sites capable of hosting the highest-speed supercomputers from three to two. Partner with computer vendors to develop advanced architectures that show promise for meeting future computing needs of the complex. Deploy a common user environment for supercomputing across the three national laboratories. Recognize that simulation will play an increasing role in all phases of the life-cycle of nuclear weapons and will continue to underpin the nuclear deterrent.
- Operate major science facilities (e.g., the Los Alamos Neutron Science Center (LANSCE), Omega, Z, DARHT, U1a, the Joint Actinide Shock Physics Experimental Research (JASPER) facility, and the National Ignition Facility (NIF)) as effective, national, shared user facilities.
- Re-engineer flight testing approach for air-delivered weapons to significantly reduce the cost of operations and NNSA infrastructure. Options to be considered include ceasing operations at the Tonopah Test Range in 2009 and transfer of flight tests to alternative sites.
- Dispose of excess facilities.

By the 2020s, the physical footprint of the weapons complex would be substantially reduced through a series of consolidation and new construction activities. This transformation would be implemented in phases to both manage risks to the nuclear deterrent and ensure the long-term infrastructure is not burdened by capabilities only applicable to legacy weapons.

STRATEGY 3: Create a fully integrated and interdependent nuclear weapons complex:

This strategy will focus on changing the operating philosophy of the nuclear weapons complex to become more efficient, more interdependent with duplication eliminated (except as required to manage risks), more uniform in technical and administrative practices, more responsive, and less costly. The following are proposed for this strategy:

- Create an integrated, interdependent system of laboratories, plants, and test sites based on support of the transformed nuclear deterrent. In the near-term, add incentives to current contracts to promote integration and interdependence. Work toward fewer and more standard contracts. Provide multi-site contract incentives starting in 2006 for a nuclear weapons complex with shared risks and rewards. Reward a balanced approach to mission, safety, and security performance. This interdependent Complex will have incentives to:
  - Meet stockpile obligations and ensure stockpile safety, security, and reliability.
  - Sustain the scientific base and essential nuclear capabilities to ensure peer review and intellectual viability.
  - Consolidate missions and capabilities (within and between sites) consistent with national security and weapons workload projections.